Heat exchanger DLLs & GUIs for AHU-Software

With the HES applications, namely ***air heaters, air coolers, condensers, injection evaporators and in the future also several heat recovery systems***, not only fin coil heat exchangers can be calculated, but also various geometries can be compared according to criteria such as price, weight, content, installation length, pressure drop.

The requirements of the customers were that the presentation (GUI = Graphical User Interface) was the same as in the Excel-based applications, which are used standalone. This makes it unnecessary to rethink how to use it.

Furthermore, our neutral GUIs ensure, that you have exactly the same possibilities, as in the EXE, which is given away free of charge for use as a standalone application, when you buy the DLL and GUI. The EXE calculates up to 40 different fin coil heat exchanger geometries in less than 1 second. Our neutral EXE and GUI support 6 languages, namely ***German, English, French, Italian, Russian, Spain***. The integration of other languages is possible at the customer's request, but would have to be borne by the customer in terms of costs.

If a potential customer would only purchase our neutral DLL for the calculation of the fin coil heat exchangers for currently CHF 2,400 and want to create the GUI with the same range of functions himself, he would have to reckon with 2 to 3 months of programming work.

From this point of view, our price for the GUI of currently also CHF 2,400 can be classified as peanuts.

Frage an meinen Programmierer

Ein Kunde fragt, ob es richtig ist, wenn er die DLL und die GUIDLL kauft, dass er dann die gleichen Optionen wie in der EXE hat, zum Beispiel das Ausdrucken des Ergebnisses.

Das ist natürlich richtig!

1. **Heater.dll: Besteht aus dem SW-Modell, den Daten und dem Berechnungsverfahren.**
2. **HeaterGUI.dll: Nutzt Heater.dll und seine Daten zur Darstellung der Ein-/Ausgabedaten und aller Ausgabefunktionen, inklusive Drucken, PDF, Kopieren, Öffnen, Speichern.**
3. **Heater.exe: Ruft einfach HeaterGUI.dll auf und hat die gleiche Ansicht und volle Funktionalität.**

Answer from my programmer

A customer asks whether it is correct, if he buys the DLL and the GUIDLL, that he then has the same options as in the EXE, for example printing the result.

Thats, of course, correct!

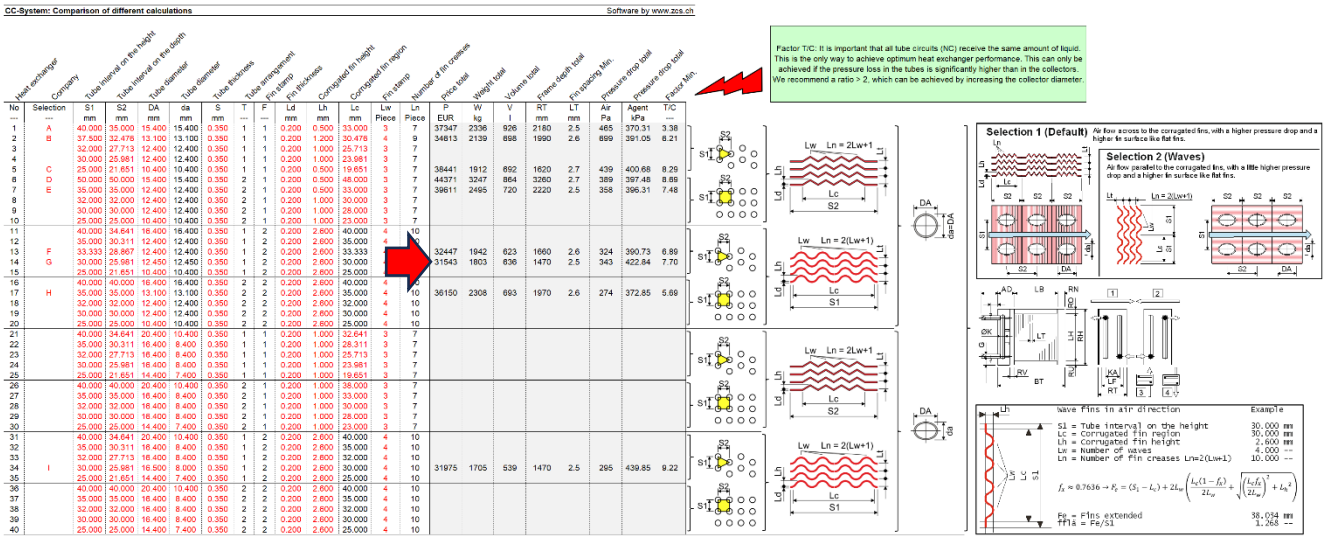
1. **Heater.dll: Consist the software model, data and calculation procedure.**
2. **HeaterGUI.dll: Use Heater.dll and its data to represent the input/output parameters and all output functions, inclusive print, pdf, copy, open, save.**
3. **Heater.exe: Just calls HeaterGUI.dll and has the same view and full functionality.**

The objection that manufacturers of fin coil heat exchangers would give away DLLs free of charge, if they have them at all and a type examination by the TÜV is questionable, is of course true out of self-interest, as they want to sell their own products with reduced effort.

However, this must be countered by the fact, that such dozens of built-in DLL have far too many differences in capacity and pressure drop and their different handling is far too complex. For this reason, several manufacturers of air conditioning units have already deleted all these different DLL and replaced them with our neutral DLL and GUI.

Example of the CCSF heat recovery system, with a focus on cooling and dehumidification in summer.

The following table in the software allows 40 different geometries for the fin coil heat exchangers, with all red values being customizable inputs. Smooth and embossed fins can be calculated, whereby in the case of embossed fins such transverse or longitudinal to the air direction are possible. Round and oval tubes are supported.



Example of the CCSF heat recovery system, with a focus on cooling and dehumidification in summer.

CC-System in summer		SACo1	SACo2	SAHe	RAHe
Capacity	kW	115.397	160.313	50.721	64.675
Surface reserve	%	1.284	1.388	0.209	1.571
Present surface	m2	1413.845	473.511	177.112	1362.490
Temp.	°C	32.000	18.460	10.000	21.000
Rel. humidity	%	40.000	89.391	100.000	100.000
Abs. humidity	g/kg	11.860	11.860	7.631	15.619
Temp. out	°C	18.460	10.000	16.000	28.852
Rel. humidity out	%	89.391	100.000	67.620	62.675
Abs. humidity out	g/kg	11.860	7.631	7.631	15.619
Velocity	m/s	1.893	1.829	1.804	1.826
Pressure drop	Pa	134.402	63.454	22.473	122.244

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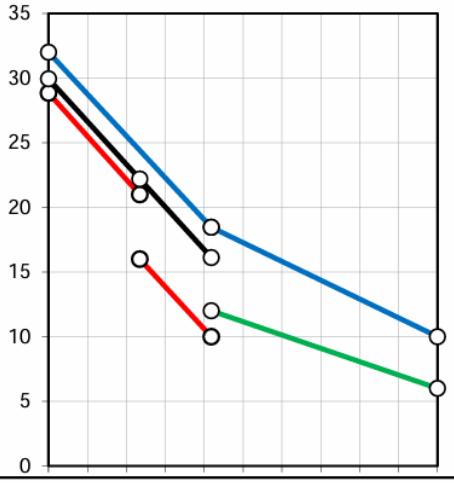
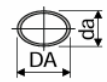
Definition		
Height over sea level	m	0.000
Pressure	hPa	1013.250
Temp.	°C	20.000
Rel. humidity	%	40.000
Supply air	m3/h	25000.000
Return air	m3/h	24000.000
25 V% Et.glycol		
Temp. in	°C	16.130
Temp. out	°C	29.950
Volume flow	m3/h	7.756
Pressure drop total	kPa	422.842
Water		SA-Co2
Temp. in	°C	6.000
Temp. out	°C	12.000
Volume flow	m3/h	22.934
Pressure drop	kPa	37.325



Technical data		SACo1	SACo2	SAHe	RAHe
Tubes blank	Piece	0	6	0	2
Int. vent./drains	Piece	7	0	1	7
Tube rows on the depth	Piece	16	6	4	16
Tube rows on the height	Piece	50	50	50	50
Number of circuits (NC)	Piece	20	49	20	19
Volume	l	234	104	64	234
Weight	kg	694	276	153	680
Connections	G	2"	3"	2"	2"
Frame height	RH	1560	1560	1560	1560
Frame width	BT	2710	2710	2710	2710
Frame depth	RT	510	250	200	510
Finned height	LH	1500	1500	1500	1500
Finned width	LB	2513	2497	2513	2513
Frame on top	RO	30	30	30	30
Frame on bottom	RU	30	30	30	30
Frame in front	RV	30	30	30	30
Frame on back	RN	53	53	53	53
Collector covering	AD	144	160	144	144
Fin spacing	LT	2.500	2.800	5.300	2.600
Fin thickness	LD	0.200	0.200	0.200	0.200
Tube diameter	DA	12.450	12.450	12.450	12.450
Tube diameter	da	12.450	12.450	12.450	12.450
Tube thickness	S	0.350	0.350	0.350	0.350
Tube interval on the height	S1	30.000	30.000	30.000	30.000
Tube interval on the depth	S2	25.981	25.981	25.981	25.981
Tubes	---	Cu	Cu	Cu	Cu
Tubes	---	smooth	smooth	smooth	smooth
Tubes	---	staggered	staggered	staggered	staggered
Tubes	Type	circular	circular	circular	circular
Collector	---	0.2	Cu	Cu	Cu
Connections	---	Rg7	Rg7	Rg7	Rg7
Fins	---	Al	Al	Al	Al
Fins	---	Wave structure	Wave structure	Wave structure	Wave structure
Frame	---	AISI 304	AISI 304	AISI 304	AISI 304
Protection	---	without	without	without	without
Protection	---	---	---	---	---
Price	**EUR**	**11989.00**	**4889.00**	**2841.00**	**11824.00**



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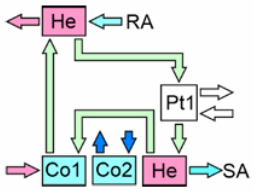

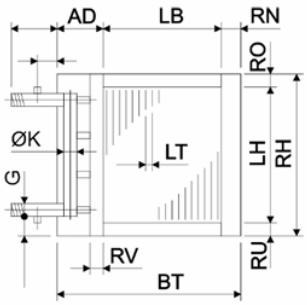

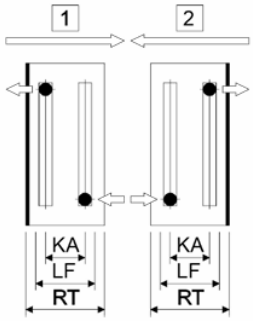

Example of the CCSF heat recovery system in winter, where the focus is on preheating.

CC-System in winter		SAHe1	SACo2	SAHe2	RACo
Capacity	kW	236.866		38.867	192.774
Surface reserve	%	0.000		0.118	0.240
Present surface	m2	1413.845	473.511	177.112	1362.490
Temp. in	°C	-11.000		17.350	20.000
Rel. humidity in	%	90.000		10.735	40.000
Abs. humidity in	g/kg	1.306		1.306	5.784
Temp. out	°C	17.350		22.000	0.755
Rel. humidity out	%	10.735		8.049	99.807
Abs. humidity out	g/kg	1.306		1.306	3.990
Velocity	m/s	1.724	1.724	1.827	1.708
Pressure drop	Pa	120.265	48.560	22.675	125.991

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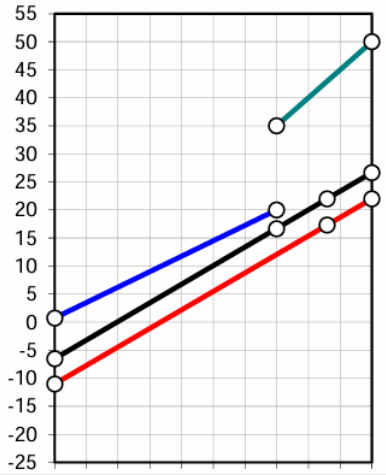
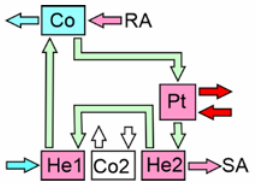
Definition		
Height over sea level	m	0.000
Pressure	hPa	1013.250
Temp.	°C	20.000
Rel. humidity	%	40.000
Supply air	m3/h	25000.000
Return air	m3/h	24000.000
25 V% Et.glycol		
Temp. in	°C	26.673
Temp. out	°C	-6.505
Volume flow	m3/h	7.756
Pressure drop total	kPa	485.718
Water		
Temp. in	°C	---
Temp. out	°C	---
Volume flow	m3/h	---
Pressure drop	kPa	---





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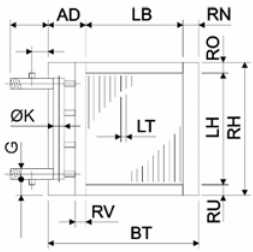
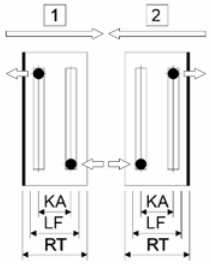
Technical data		SA-He1	SA-Co	SA-He2	RA-Hy
Tubes blank	Piece	0	6	0	2
Int. vent./drains	Piece	7	0	1	7
Tube rows on the depth	Piece	16	6	4	16
Tube rows on the height	Piece	50	50	50	50
Number of circuits (NC)	Piece	20	49	20	19
Volume	l	234	104	64	234
Weight	kg	694	276	153	680
Connections	G	2"	3"	2"	2"
Frame height	RH	1560	1560	1560	1560
Frame width	BT	2710	2710	2710	2710
Frame depth	RT	510	250	200	510
Finned height	LH	1500	1500	1500	1500
Finned width	LB	2513	2497	2513	2513
Frame on top	RO	30	30	30	30
Frame on bottom	RU	30	30	30	30
Frame in front	RV	30	30	30	30
Frame on back	RN	53	53	53	53
Collector covering	AD	144	160	144	144
Fin spacing	LT	2.500	2.800	5.300	2.600
Fin thickness	LD	0.200	0.200	0.200	0.200
Tube diameter	DA	12.450	12.450	12.450	12.450
Tube diameter	da	12.450	12.450	12.450	12.450
Tube thickness	S	0.350	0.350	0.350	0.350
Tube interval on the height	S1	30.000	30.000	30.000	30.000
Tube interval on the depth	S2	25.981	25.981	25.981	25.981
Tubes	---	Cu	Cu	Cu	Cu
Tubes	---	smooth	smooth	smooth	smooth
Tubes	---	staggered	staggered	staggered	staggered
Tubes	Type	circular	circular	circular	circular
Collector	---	Cu	Cu	Cu	Cu
Connections	---	Rg7	Rg7	Rg7	Rg7
Fins	---	Al	Al	Al	Al
Fins	---	Wave structure	Wave structure	Wave structure	Wave structure
Frame	---	AISI 304	AISI 304	AISI 304	AISI 304
Protection	---	without	without	without	without
Protection	---	---	---	---	---
Price	**EUR**	**11989.00**	**4889.00**	**2841.00**	**11824.00**

Heat exchanger (Pt)		
Capacity	kW	82.959
in	°C	50.000
out	°C	35.000
in	°C	16.691
out	°C	26.673





Example of the CCSF heat recovery system according to DIN EN 308, with the focus on temperature efficiency.

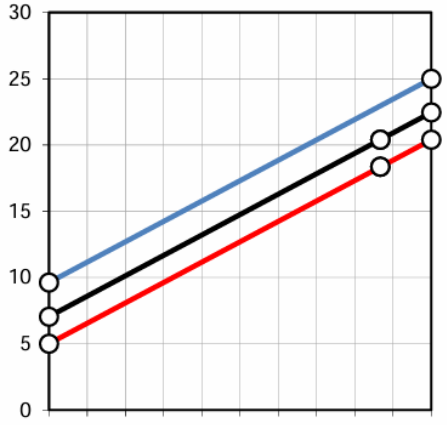
CC-System in winter		SAHe1308	SACo2	SAHe2308	RACo308
Capacity	kW	111.255		17.036	128.290
Surface reserve	%	0.001		0.288	0.419
Present surface	m2	1413.845	473.511	177.112	1362.490
Temp. in	°C	5.000		18.345	25.000
Rel. humidity in	%	0.000		0.000	0.000
Abs. humidity in	g/kg	0.000		0.000	0.000
Temp. out	°C	18.345		20.388	9.615
Rel. humidity out	%	0.000		0.000	0.000
Abs. humidity out	g/kg	0.000		0.000	0.000
Velocity	m/s	1.773	1.773	1.821	1.809
Pressure drop	Pa	123.990	48.560	22.576	123.357

Temp. efficiency	%	76.940

Definition		
Height over sea level	m	0.000
Pressure	hPa	1013.250
Temp.	°C	20.000
Rel. humidity	%	40.000
Supply air	m3/h	25000.000
Return air	m3/h	25000.000

25 V% Et.glycol		
Temp. in	°C	22.453
Temp. out	°C	7.043
Volume flow	m3/h	7.756
Pressure drop total	kPa	446.885

Temp. (°C)



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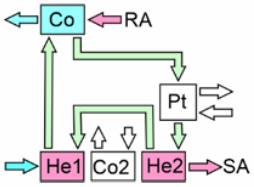

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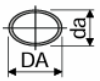
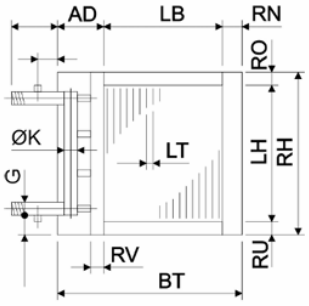
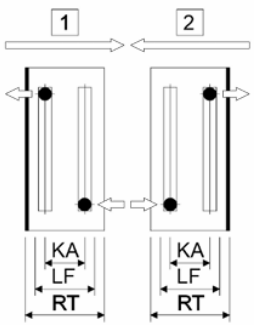
Technical data		SA-He1	SA-Co	SA-He2	RA-Hy
Tubes blank	Piece	0	6	0	2
Int. vent./drains	Piece	7	0	1	7
Tube rows on the depth	Piece	16	6	4	16
Tube rows on the height	Piece	50	50	50	50
Number of circuits (NC)	Piece	20	49	20	19
Volume	l	234	104	64	234
Weight	kg	694	276	153	680
Connections	G	2"	3"	2"	2"
Frame height	RH	1560	1560	1560	1560
Frame width	BT	2710	2710	2710	2710
Frame depth	RT	510	250	200	510
Finned height	LH	1500	1500	1500	1500
Finned width	LB	2513	2497	2513	2513
Frame on top	RO	30	30	30	30
Frame on bottom	RU	30	30	30	30
Frame in front	RV	30	30	30	30
Frame on back	RN	53	53	53	53
Collector covering	AD	144	160	144	144
Fin spacing	LT	2.500	2.800	5.300	2.600
Fin thickness	LD	0.200	0.200	0.200	0.200
Tube diameter	DA	12.450	12.450	12.450	12.450
Tube diameter	da	12.450	12.450	12.450	12.450
Tube thickness	S	0.350	0.350	0.350	0.350
Tube interval on the height	S1	30.000	30.000	30.000	30.000
Tube interval on the depth	S2	25.981	25.981	25.981	25.981
Tubes	---	Cu	Cu	Cu	Cu
Tubes	---	smooth	smooth	smooth	smooth
Tubes	---	staggered	staggered	staggered	staggered
Tubes	Type	circular	circular	circular	circular
Collector	---	Cu	Cu	Cu	Cu
Connections	---	Rg7	Rg7	Rg7	Rg7
Fins	---	Al	Al	Al	Al
Fins	---	Wave structure	Wave structure	Wave structure	Wave structure
Frame	---	AISI 304	AISI 304	AISI 304	AISI 304
Protection	---	without	without	without	without
Protection	---	---	---	---	---
Price	**EUR**	**11989.00**	**4889.00**	**2841.00**	**11824.00**







Example of the CCSF heat recovery system, with a focus on cooling and dehumidification in summer.

Here, a planning engineer has demanded, that the exhaust air is not adiabatically pre-cooled in summer. This reduces the capacity output from the exhaust air from 64,675 kW to 32,815 kW, i.e. by half. He could just as well decouple the exhaust air from the intermediate carrier side, as the cooling requirement for the supply air is 277.322 kW, ***which reduces the yield from the exhaust air from 23.46% to 11.83%.*** ***His ego does not allow this planning engineer to correct his tender.***

CC-System in summer		SACo1	SACo2	SAHe	RAHe
Capacity	kW	83.529	193.793	50.714	32.815
Surface reserve	%	0.841	5.894	77.877	0.775
Present surface	m2	1413.845	473.511	177.112	1362.490
Temp.	°C	32.000	22.200	10.000	26.000
Rel. humidity	%	40.000	70.995	98.999	54.865
Abs. humidity	g/kg	11.860	11.860	7.554	11.500
Temp. out	°C	22.200	10.000	16.000	30.013
Rel. humidity out	%	70.995	98.999	66.944	43.450
Abs. humidity out	g/kg	11.860	7.554	7.554	11.500
Velocity	m/s	1.905	1.841	1.803	1.833
Pressure drop	Pa	135.337	60.223	22.468	122.416

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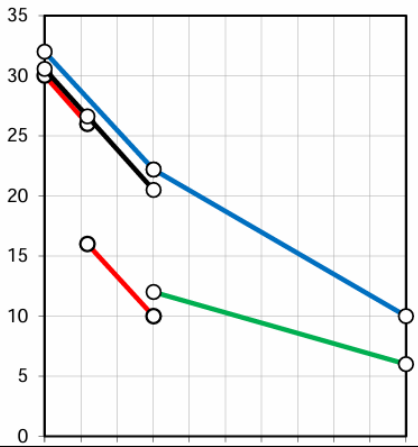
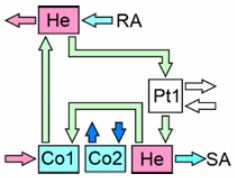
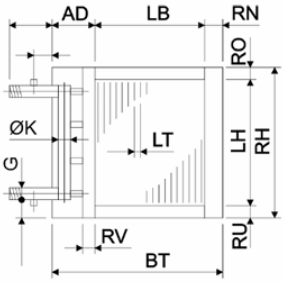
Definition		
Height over sea level	m	0.000
Pressure	hPa	1013.250
Temp.	°C	20.000
Rel. humidity	%	40.000
Supply air	m3/h	25000.000
Return air	m3/h	24000.000
25 V% Et.glycol		
Temp. in	°C	20.500
Temp. out	°C	30.560
Volume flow	m3/h	7.706
Pressure drop total	kPa	411.693
Water		SA-Co2
Temp. in	°C	6.000
Temp. out	°C	12.000
Volume flow	m3/h	27.719
Pressure drop	kPa	52.659

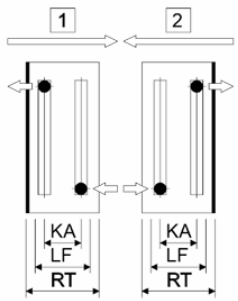


Technical data		SACo1	SACo2	SAHe	RAHe
Tubes blank	Piece	0	6	0	2
Int. vent./drains	Piece	7	0	1	7
Tube rows on the depth	Piece	16	6	4	16
Tube rows on the height	Piece	50	50	50	50
Number of circuits (NC)	Piece	20	49	20	19
Volume	l	234	104	64	234
Weight	kg	694	276	153	680
Connections	G	2"	3"	2"	2"
Frame height	RH	1560	1560	1560	1560
Frame width	BT	2710	2710	2710	2710
Frame depth	RT	510	250	200	510
Finned height	LH	1500	1500	1500	1500
Finned width	LB	2513	2497	2513	2513
Frame on top	RO	30	30	30	30
Frame on bottom	RU	30	30	30	30
Frame in front	RV	30	30	30	30
Frame on back	RN	53	53	53	53
Collector covering	AD	144	160	144	144
Fin spacing	LT	2.500	2.800	5.300	2.600
Fin thickness	LD	0.200	0.200	0.200	0.200
Tube diameter	DA	12.450	12.450	12.450	12.450
Tube diameter	da	12.450	12.450	12.450	12.450
Tube thickness	S	0.350	0.350	0.350	0.350
Tube interval on the height	S1	30.000	30.000	30.000	30.000
Tube interval on the depth	S2	25.981	25.981	25.981	25.981
Tubes	---	Cu	Cu	Cu	Cu
Tubes	---	smooth	smooth	smooth	smooth
Tubes	---	staggered	staggered	staggered	staggered
Tubes	Type	circular	circular	circular	circular
Collector	---	0.2	Cu	Cu	Cu
Connections	---	Rg7	Rg7	Rg7	Rg7
Fins	---	Al	Al	Al	Al
Fins	---	Wave structure	Wave structure	Wave structure	Wave structure
Frame	---	AISI 304	AISI 304	AISI 304	AISI 304
Protection	---	without	without	without	without
Protection	---	---	---	---	---
Price	**EUR**	**11989.00**	**4889.00**	**2841.00**	**11824.00**

Software by www.zcs.ch







In total, there are said to be about 40 manufacturers of air conditioning units in German-speaking countries, whereby ***a maximum of 10 companies are likely to fall*** under the predicate of well-known.

Our DLLs and GUIs are ***not free of charge***, as they can be used to calculate and, above all, compare all the fin coil heat exchanger geometries offered on the market.

However, the prerequisite is that these manufacturers of air conditioners ***have independently developed higher-level software*** for the design of their air conditioning units and do not use narrow-gauge applications from software companies such as www.gj-isc.it, www.divid.se, www.unilab.eu.

There is supposed to ***be too much bullshit*** in it, such as dozens of DLLs for fin coil heat exchangers with totally unreasonable differences of up to 50% in terms of performance and pressure drop.

You could just as well use a divining rod!

And finally, some news from the big wide world and small-minded Switzerland.

Russia and China, 2 superpowers, are joining forces against the West in ***the proxy war*** in Ukraine.

Since 2014, Vladimir Putin has been getting what ***he wants in Ukraine***.

Vladimir Putin is internationally advertised as a war criminal by ***arrest warrant***, which does not interest governments in China, Serbia, Hungary, etc. at all.

And what are the US, the EU and NATO doing? Ukraine is being helped only ***half-heartedly and belatedly***.

And the brakes are the Republicans in the USA, above all Donald Trump, and Germany with the ***hesitant Olaf Scholz***.

Not to mention France with Emmanuel Macron, who ***plays Napoleon*** and only utters stupid sayings.

And what is Switzerland doing? Once again, they are playing the pseudo-neutral mediator with tens of millions at the expense of taxpayers to a so-called ***high-level*** conference on peace in Ukraine, where the adversary Russia is not invited and its ally China does not participate.

High-level? Drinking, eating and whoring at the expense of the taxpayers.